

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

Mark Brunkhart et al.

Application No.: NEW

Filed: HEREWITH

For: INTEGRATED SYSTEM FOR QUICKLY  
AND ACCURATELY IMAGING AND  
MODELING THREE-DIMENSIONAL  
OBJECTS

Group Art Unit: Unknown

Examiner: Unknown

**INFORMATION DISCLOSURE  
STATEMENT**

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## M/S PATENT APPLICATION

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

Applicant(s) submit(s) herewith patents, publications or other information [attached hereto and listed on the attached Form PTO-1449 (modified)] of which they are aware, which they believe(s) may be material to the examination of this application and in respect of which there may be a duty to disclose in accordance with 37 CFR § 1.56.

This Information Disclosure Statement:

- (a) ☒ accompanies the new patent application submitted herewith. 37 CFR § 1.97(a).
- (b) ☐ is filed within three months after the filing date of the application or within three months after the date of entry of the national stage of a PCT application as set forth in 37 CFR § 1.491.
- (c) ☐ as far as is known to the undersigned, is filed before the mailing date of a first Office Action on the merits, or before a first office action after filing a Request for Continued Examination under §1.114.
- (d) ☐ is filed after the first office action and more than three months after the application's filing date or PCT national stage date of entry filing but, as far as is known to the undersigned, prior to the mailing date of either a final rejection or a

notice of allowance, whichever occurs first, and is accompanied by either the fee (\$180) set forth in 37 CFR § 1.17(p) or a certification as specified in 37 CFR § 1.97(e), as checked below.

- (e) ☐ is filed after the mailing date of either a final rejection or a notice of allowance, whichever occurred first, and the Issue Fee has not been paid, and is accompanied by the fee (\$130) set forth in 37 CFR § 1.17(i)(1) and a certification as specified in 37 CFR § 1.97(e), as checked below. This document is to be considered as a petition requesting consideration of the information disclosure statement.

[If either of boxes (d) or (e) is checked above, the following "certification" under 37 CFR § 1.97(e) may need to be completed.] The undersigned certifies that:

- (f) ☐ Each item of information contained in the information disclosure statement was cited in a communication mailed from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this information disclosure statement.
- (g) ☐ No item of information contained in this information disclosure statement was cited in a communication mailed from a foreign patent office in a counterpart foreign application or, to the knowledge of the undersigned after making reasonable inquiry, was known to any individual designated in 37 CFR § 1.56(c) more than three months prior to the filing of this information disclosure statement.

A list of the patent(s) or publication(s) is set forth on the attached Form PTO-1449 (Modified).

A copy of the items on PTO-1449 (Modified) is supplied herewith, except as noted below.

Those patent(s) or publication(s) which are marked with an asterisk (\*) in the attached form PTO-1449 (Modified) are not supplied because they are (a) either U.S. Patents and this an application filed after June 30, 2003, or (b) were previously cited by or submitted to the Office in a prior application no. 10/079,203, filed February 20, 2002, and 09/177,777, filed October 23, 1998, and relied upon in this application for an earlier filing date under 35 U.S.C. § 120.

A concise explanation of relevance of the items listed on form PTO-1449 (Modified) is:

- (k) ☒ not given
- (l) ☐ given for each listed item

- (m) ☐ given for only non-English language listed item(s) [Required]
- (n) ☐ is in the form of an English language copy of a Search Report from a foreign patent office, issued in a counterpart application, which refers to the relevant portions of the references [copy attached].

The Examiner is reminded that a "concise explanation of the relevance" of the submitted items "may be nothing more than identification of the particular figure or paragraph of the patent or publication which has some relation to the claimed invention," MPEP § 609.

While the information and references disclosed in this Information Disclosure Statement may be "material" pursuant to 37 CFR § 1.56, it is not intended to constitute an admission that any patent, publication or other information referred to therein is "prior art" for this invention unless specifically designated as such.

In accordance with 37 CFR § 1.97(g), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made or that no other material information as defined in 37 CFR § 1.56(a) exists. It is submitted that the Information Disclosure Statement is in compliance with 37 CFR § 1.98 and MPEP § 609 and the Examiner is respectfully requested to consider the listed references.

Respectfully submitted,

STALLMAN & POLLOCK LLP

Dated: September 15, 2003

By: 

Brian J. Keating  
Reg. No. 39,520

Attorneys for Applicant(s)

<b>INFORMATION DISCLOSURE CITATION</b> <i>(Use several sheets if necessary)</i>	<b>Docket Number (Optional)</b>		<b>Application Number</b>
	KYRA-420		NEW
	<b>Applicant(s)</b>		
	Mark Brunkhart et al.		
<b>Filing Date</b>		<b>Group Art Unit</b>	
HEREWITH		Unknown	

### U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE
	*AA	4,658,218	04/14/1987	Kenney-Wallace et al.	330	4.3	12/10/1984
	*AB	4,860,304	08/22/1989	Mooradian	372	92	02/02/1988
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							YES	NO
	*AS	57004564	01/11/1982	Japan (abstract)	G01S	7/48		
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### OTHER DOCUMENTS

(Including Author, Title, Date, Pertinent Pages, Etc.)

	*AY	C. Bradley et al., "Free-form Surface Reconstruction for Machine Vision Rapid Prototyping," <i>Optical Engineering</i> , September 1993, Vol. 32, No. 9, pp. 2191-2200.
	*AZ	C-W. Liao et al., "Surface Approximation of a Cloud of 3D Points," <i>Graphical Models and Image Processing</i> , January 1995, Vol. 57, No. 1, pp. 67-74.
	*BA	A.B. Dobrzeniecki et al., "Interactive and Intuitive Segmentation of Volumetric Data: The Segmentview System and the Kooshball Algorithm," Institute of Electrical and Electronics Engineers, <i>Proceedings of the International Conference on Image Processing (ICIP)</i> , October 23, 1995, Vol. 3, pp. 540-543.
	*BB	J.H. Park et al., "Three-Dimensional Object Representation and Recognition Based on Surface Normal Images," <i>Pattern Recognition</i> , June 1993, Vol. 26, No. 6, pp. 913-921.
	*BC	P.F. Hemler et al., "Active Model Matching in Range Images," <i>IEEE International Conference on Robotics and Automation</i> , March 31, 1987, Vol. 1, pp. 228-233.

<b>Examiner</b>	<b>Date Considered</b>
Examiner: Initial if citation considered, whether or not citation is in conformance with MPEP Section 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

<b>INFORMATION DISCLOSURE CITATION</b> <i>(Use several sheets if necessary)</i>	Docket Number (Optional)		Application Number
	KYRA 412 US5		NEW
	Applicant(s)		
	Mark Brunkhart et al.		
Filing Date		Group Art Unit	
HEREWITH		Unknown	

### U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE
	BD						
	BE						

### FOREIGN PATENT DOCUMENTS

	REF	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
							YES	NO
	BF							
	BG							

### OTHER DOCUMENTS

(Including Author, Title, Date, Pertinent Pages, Etc.)

	*BH	N.S. Raja et al., "Obtaining Generic Parts from Range Images Using a Multi-view Representation," <i>Image Understanding</i> , July 1994, Vol. 60, No. 1, pp. 44-64.
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	*BS	Brochure by Automated Precision, Inc., "Precision Measurement and Sensing Instruments for Manufacturing," 1996, pp. front cover, 1-15 & back cover.
	*BT	D.S. Schwartz, "Vision Metrology System: An Automated Noncontact Three-Dimensional Measurement System," <i>General Dynamics Corporation</i> , Copyright 1989, 7 pages in length.
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	*BV	D. Knopp, "Megamodels from MicroStation - Photography Goes 3D," <i>MicroStation Manager</i> , August 1994, pp. 60-63.
	*BW	M. Laasonen, "Surveying and Data Processing in Building Renovation," <i>Surveying Science in Finland</i> , Vol. 11, No. 1-2, 1993, pp. 3-14, reformatted pp. 1-7.
	*BX	A.J. Mäkyinen et al., "Tracking Laser Radar for 3-D Shape Measurements of Large Industrial Objects Based on Time-of-Flight Laser Rangefinding and Position-Sensitive Detection Techniques," <i>IEEE Transactions on Instrumentation and Measurement</i> , Vol. 43, No. 1, February 1994, pp. 40-49.

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<b>INFORMATION DISCLOSURE CITATION</b> <i>(Use several sheets if necessary)</i>	<b>Docket Number (Optional)</b> <b>KYRA 412 US5</b>	<b>Application Number</b> <b>NEW</b>
	<b>Applicant(s)</b> <b>Mark Brunkhart et al.</b>	
	<b>Filing Date</b> <b>HEREWITH</b>	<b>Group Art Unit</b> <b>Unknown</b>

### U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE
	BY						
	BZ						

### FOREIGN PATENT DOCUMENTS

	REF	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
							YES	NO
	CA							
	CB							

### OTHER DOCUMENTS

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	*CC	T.T. Wohlers, "3D Digitizers," <i>Computer Graphics World</i> , July 1992, pp. 73-77.
	*CD	T. Wohlers, "The Challenge of 3D Digitizing," <i>Computer Graphics World</i> , November 1995, pp. 21-22.
	*CE	T. Wohlers, "3D Digitizing Systems," <i>Computer Graphics World</i> , April 1994, pp. 59-61.
	*CF	K. Määttä et al., "Profiling of hot surfaces by pulsed time-of-flight laser range finder techniques," <i>Applied Optics</i> , Vol. 32, No. 27, 20 September 1993, pp. 5334-5347.
	*CG	R.E. Garrett, "Advanced Technology for Blasters," <i>Rock Products</i> , January 1996, pp. 37-42.
	*CH	Brochure by IBEO Systems, Inc., "Information on the LADAR Scanning System," IBEO Systems, October 13, 1994, 20 pages in length.
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	*CJ	Article by W. Niemeier et al., "Use of Laser Scanners for the Determination of Building Geometries," December 1995, pp. 275-284c.
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	*CL	R.J. Pinheiro et al., "Laser Range Image Interpretation for Automated Mapping of Hazardous Environments," 1995.
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	*CN	Brochure by CATCO, "Laser Mapping System," January 1996, 27 pages in length.
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	*CP	Brochure by Laser Atlanta, "Prosurvey 1000 and Geolink Mapping Systems," July 1992, 10 pages in length.
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	*CS	S. Ball, "Autoscanning Laser Systems a Valuable Tool," September 1996, 2 pages in length.
	*CT	C. Bradley et al., "Free-form surface reconstruction for machine vision rapid prototyping," <i>Optical Engineering</i> , Vol. 32, No. 9, September 1993, pp. 2191-2200.
	*CU	P. Vähä et al., "Application of 3-D CAD and 3-D Coordinate Meter in Frame Erection," <i>Automation and Robotics in Construction X, Elsevier Science Publishers B.V.</i> , 1993, pp. 487-494.
	*CV	"Take a Photo, Create a Model," <i>Computer Graphics World</i> , May 1994, pp. 58-59.
	*CW	I. Kaisto et al., "Laser Rangefinding Techniques in the Sensing of 3-D Objects," <i>SPIE</i> , Vol. 1260, Sensing and Reconstruction of Three-Dimensional Objects and Scenes, 1990, pp. 122-133.
	*CX	B. Turko, "A Picosecond Resolution Time Digitizer for Laser Ranging," <i>IEEE Transactions on Nuclear Science</i> , Vol. NS-25, No. 1, February 1978, pp. 75-80.
	*CY	K.W. Wong et al., "GPS-Guided Vision Systems for Real-Time Surveying," <i>Journal of Surveying Engineering</i> , Vol. 115, No. 2, May 1989, pp. 243-251.

Examiner	Date Considered
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	<b>Applicant(s)</b> <b>Mark Brunkhart et al.</b>	
	<b>Filing Date</b> <b>HEREWITH</b>	<b>Group Art Unit</b> <b>Unknown</b>

**U.S. PATENT DOCUMENTS**

*EXAMINER INITIAL	REF	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE
	CZ						
	DA						

**FOREIGN PATENT DOCUMENTS**

	REF	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
							YES	NO
	DB							
	DC							

**OTHER DOCUMENTS**

*(Including Author, Title, Date, Pertinent Pages, Etc.)*

	*DD	R.R. Clark et al., "A Laser Distance Measurement Sensor for Industry and Robotics," <i>Sensors</i> , June 1994, pp. 43-45 and 47.
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	*DF	Brochure, Kreon, 1995, 7 pages in length.
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	*DQ	Brochure, "Access problems? Prism Problems? Gota do it fast?," Cubic Precision, date unknown, 5 pages in length.
	*DR	F.J.M. Schmitt et al., "An Adaptive Subdivision Method for Surface-Fitting from Sampled Data," <i>ACM-SIGGRAPH</i> 1986, pp. 179-188.
	*DS	J.D. Foley et al., "Computer Graphics – Principles and Practice," Addison-Wesley Publishing Company, 1996, pp. 471-531.

<b>Examiner</b>	<b>Date Considered</b>
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